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**10/510442****DT04 Rec'd PCT/PTO 07 OCT 2004****NEW CLAIMS**

1. Paper feeding device (33) for dot printers, for instance for a compact, ink jet photographic printer (21), comprising :
- a paper feeding motor (83), and
- 5 a changeover mechanism (149) arranged downstream of said motor (83) and suitable for actuation in response to predetermined operating conditions of the printer to move a sheet to be printed (26) at high speed in a preparation stage and at high resolution in association with printing,
- said paper feeding device (33) being provided for movement of the sheet
- 10 (26) in a given direction of printing (FW), and being **characterized in that** the preparation stage includes in sequence sub-stages of feeding and retracting,
- wherein the feeding sub-stage is associated with picking of the sheet from a pack with movement of the sheet (26) in a direction consistent with the direction of printing (FW) and the retracting sub-stage includes the movement of the sheet (26)
- 15 in the direction (BW) opposite the direction of printing (FW), along an alternative path to the picking path.
2. Device according to claim 1 **characterized in that** the preparation stage includes a positioning sub-stage after the retracting sub-stage with movement of the sheet (26) consistent with the direction of printing (FW).
- 20 3. Device according to claims 1 or 2, **characterized in that** said changeover mechanism (149) is provided for moving a sheet (26) at high speed in an expulsion stage, subsequent to its being printed, with movement of the sheet (26) consistent with the direction of printing (FW).
4. Paper feeding device (33) for dot printers, for instance for a compact, ink jet
- 25 photographic printer (21), comprising :

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a paper feeding motor (83), and

a changeover mechanism (149) arranged downstream of said motor (83) and suitable for actuation in response to predetermined operating conditions of the printer to move a sheet to be printed (26) at high speed in a preparation stage and  
5 at high resolution in association with printing,

said paper feeding device (33) being **characterized in that** it comprises an actuating member (153) positioning of which is servo dependent on the direction of rotation (CW, CCW) of the paper feeding motor (83) for switching the changeover mechanism (151) between high speed and high resolution.

10 5. Device according to claim 4, **characterized in that** said actuating member (154) is fulcrum-mounted on the axis of the feeding motor (83) and is suitable for assuming angular positions associated with a first configuration (Fig. 4) for movement of the sheet at high speed and with a second configuration (Fig. 7) for movement of the sheet at high resolution.

15 6. Device according to claim 4 or 5, **characterized in that** it comprises a blocking group (127, 174, 172) for blocking the position of the actuating member (153) and overriding servo dependency on the above-mentioned direction of rotation (CW, CCW) and a control group (127, 128, 134, 178) liable for actuation to de-activate said blocking group.

20 7. Device according to claim 6 in which the printer comprises a carriage (31) for a printhead movable along a printing area (41), said feeding device (33) being **characterized in that** the control group (127, 128, 134, 178) is servo dependent on the carriage (31) for re-establishing servo control of the actuating member (153) in a working position of the carriage (31), external to the printing area (41).

25 8. Device according to claim 7, **characterized in that** it is applied on an ink jet

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printer comprising a cleaning station (84) in an end-of-stroke-position, said working position being adjacent to said cleaning station.

9. Device according to claim 6 or 7 or 8, **characterized in that** said blocking group (127, 174, 172) comprises storing elements (181) for storing a setting  
5 condition of said blocking group.

10. Device according to claim 1 and one of the claims from 6 to 9, **characterized in that** the retracting sub-stage is started by the feeding sub-stage with activation of the blocking group (127, 174, 172) and inversion (CW/CCW) of the direction of motion of the paper feeding motor (83).

10 11. Device according to claim 10, **characterized in that** it comprises a passage sensor (60) switchable by a sheet (26) in an end-of-picking position and in which the retracting sub-stage starts with a switching of the passage sensor (60) and terminates with another switching of the sensor upon the sheet passing through the end-of-picking position.

15 12. Device according to claim 2 and one of the claims from 6 to 11, **characterized in that** the positioning sub-stage is started by the retracting sub-stage with inversion (CCW/CW) of the direction of motion of the paper feeding motor (83) in association with an activated condition of the blocking group (127, 174, 172).

20 13. Device according to claim 12, **characterized in that** it comprises a reference sensor (61) switchable for a reference position of the sheet (26) with respect to the printing area (41) and in which said positioning sub-stage terminates with a commutation of the reference sensor (61) in the sheet reference position.

25 14. Device according to claim 2 and one of the claims from 6 to 13, **characterized in that** the printing step is started by the positioning sub-stage with

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de-activation of the blocking group (127, 174, 172) and inversion (CW/CCW) of the direction of motion of the paper feeding motor (83).

15. Device according to claim 5 and one of the claims from 6 to 14, **characterized in that** said actuating member (154) is suitable for being driven in the direction of rotation of the feeding motor (83) for determining the condition of high speed or high resolution movement and in which said blocking group comprises a stopping member (174) for blocking said actuating member in the first configuration and a removing element (127, 178) that may be actuated render the above-mentioned stopping member inoperative (178).

10 16. Device according to claim 1 or 2 including a picking mechanism (122), said feeding device (33) being **characterized by** a clutch (124) that may be connected for picking with the paper feeding motor (83) in said feeding sub-stage.

17. Device according to claims 7 or 8 and 16, **characterized in that** said clutch (124) may be actuated by the carriage (31) in a maximum overtravel position and in which said working position corresponds to an intermediate overtravel position of the above-mentioned carriage (31).

18. Device according to any one of the previous claims, **characterized in that** it comprises a worm screw (167) and helical wheel (168) coupling that may be actuated by the above-mentioned changeover mechanism (149) for high resolution movement of the sheet to be printed (26).

19. Paper feeding device (33) for dot printers, for instance for an ink jet photographic printer (21), said feeding device (33) including a paper feeding motor (83) and being **characterized in that** it comprises :

a first kinematic linkage (152) associated with said feeding motor (83) for producing high speed sheet movements in a picking and print preparation stage,

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a second kinematic linkage (153) associated with said feeding motor (83) and having a transmission ratio different from that of said first kinematic linkage for producing high resolution sheet movements in association with printing, and

an actuating member (154) for putting the first kinematic linkage (152) or the  
5 second kinematic linkage (153) into operation,

wherein, for a given direction of rotation of said motor (CCW), the second kinematic linkage (153) is suitable for determining a direction of movement of the sheet (26) opposite to that of the first kinematic linkage (152).

20. Device according to claim 19, **characterized in that** said actuating member  
10 (154) comprises a plate (156) supporting a pair of intermediate tooth wheels (159, 166) meshing with a pinion (151) of said motor and in which said plate is suitable for being driven by said pinion (151) in the direction of rotation of the feeding motor (83) for connecting in the rotation one or the other of the intermediate tooth wheels (159, 166) with the first kinematic linkage (152) or with the second kinematic  
15 linkage (153) and for maintaining this connection.

21. Device according to claim 20, **characterized in that** it comprises a blocking group (127, 174, 172) that may be actuated to block said plate (156) in a predetermined configuration allowing operativity of the first kinematic linkage for two directions of rotation of the motor (CW, CCW).

20 22. Paper feeding device (33) for dot printers, for example for an ink jet, photographic printer (21) comprising a carriage (31) for a printhead movable along a printing area (41), said device (33) including a paper feeding motor (83) and a picking mechanism (122) for picking from a pack and feeding one by one the sheets to be printed (26) and being **characterized in that** it comprises a clutch  
25 (124) for operatively connecting said picking mechanism (122) with the paper

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feeding motor (83), linkages (152 153) for moving the sheet to be printed (26) with different degrees of resolution and a control group (127, 128, 134, 178) servo dependent on the carriage (31) for commanding said clutch and said linkages in different positions of the carriage (31), outside the printing area (41).

5 23. Paper feeding device (33) for dot printers, for example for a compact, ink jet, photographic printer (21), said feeding device including a paper feeding motor (83) and being **characterized by** a kinematic linkage (153) comprising a worm screw (167) that may be actuated by the above-mentioned paper feeding motor and a helical wheel (168) for moving a sheet (26) at high resolution in association  
10 with printing.

24. Device according to claim 23, **characterized in that** it comprises a support (156) for said worm screw (167) and upon which rotates an intermediate tooth wheel (166) integral in rotation with said worm screw and meshing with a pinion (151) of said motor, and in which said support (156) is suitable for being driven by  
15 said pinion (151) in a predetermined direction of rotation (CCW) of the motor (83) for bringing the worm screw (167) into engagement with the helical wheel (168) and for maintaining this engagement.

25. Device according to claim 24, **characterized in that** it comprises clutching means operating on the whole made up of the worm screw (167) and the  
20 intermediate tooth wheel (166) having an anti-vibration function in the meshing between said worm screw (167) and said helical wheel (168).

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